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INTERIM REPORT ON PESTICIDE LEVELS IN FISH FROM TWO INDUSTRIAL LAKES, AT ROCKY MOUNTAIN ARSENAL

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13. ABSTRACT (Maximum 200 words)
THE FINDINGS IN THIS REPORT INDICATE THAT THE LEVELS OF ALDRIN AND DIELDRIN IN FLESH (EDIBLE PORTION) OF FISH FROM LOWER DERBY LAKE VARIED FROM 0.03 PPM TO 15.5 PPM. ALDRIN AND DIELDRIN IN FLESH FROM LAKE LADORA FISH HAVE NOT EXCEEDED 0.1 PPM. FISH LIVERS WERE GENERALLY HIGHER IN PESTICIDE CONTENT. THESE LEVELS OF ALDRIN AND DIELDRIN FOUND IN EDIBLE PORTIONS OF FISH CAUGHT FROM LOWER DERBY LAKE FAR EXCEED SAFE LIMITS LISTED BY THE WORLD HEALTH ORGANIZATION (WHO). LEVELS IN FISH FROM LAKE LADORA SHOULD BE CONSIDERED POTENTIALLY HARMFUL, BASED ON WHO RECOMMENDATIONS. SAMPLING WILL CONTINUE FROM BOTH LOWER DERBY LAKE AND LAKE LADORA.

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INTERIM REPORT ON PESTICIDE LEVELS IN FISH FROM TWO INDUSTRIAL LAKES AT ROCKY MOUNTAIN ARSENAL

MARCH 1975

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CANCELLED Upon Completion
of Project

LIFE SCIENCES LABORATORY DIVISION
U.S. ARMY DUGWAY PROVING GROUND
DUGWAY, UTAH 84022

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1. REFERENCES:

a. Incident Report on the Wildlife Mortalities at RMA during the period 4 April 1973 to 14 June 1973, 10 July 1973.

b. Preliminary Environmental Study for Rocky Mountain Arsenal, October 1974.

2. INTRODUCTION:

Aldrin and dieldrin, members of the chlorinated group of pesticides, are rated from third to seventh most toxic of 53 chemicals tested.[1] They are persistent in the environment, cumulative in living organisms, including man, and decline only after many months following stoppage of their intake.[1-4]

Aldrin in the body is eventually metabolized to dieldrin and is stored as such.[2] Levels of dieldrin in human adipose tissue currently average from 0.03 parts per million (ppm) in India to 0.45 ppm in Italy (0.22 ppm in U.S.).[3]

Dieldrin has been shown to cause birth defects, mental deficiencies and increased incidence of tumors in laboratory and domestic animals.[2,4] Investigations of the carcinogenic effect and its relationship to human cancer are continuing.[4]

The World Health Organization has recommended that human average daily intakes of aldrin and dieldrin not exceed 0.0001 mg/kg body weight.[4]

Published limits of dieldrin in foodstuffs range from 0.02 ppm to 0.2 ppm based on the average daily consumption of the particular food item.[4]

3. BACKGROUND:

Samples of fish* have been collected intermittently from the industrial lakes at RMA between June 1973 and January 1975. Fish were harvested by rod and reel. Tissues (liver and flesh) were removed and labeled, then frozen in dry ice and transported to the Chemical Laboratory, Dugway Proving Ground, where they were assayed for pesticide content using gas chromatographic (GC) methods. Standards of aldrin and dieldrin, obtained from the Perrine Pesticide Repository, were used for quantitation.

*Largemouth bass and bluegills.

4. FINDINGS:

Levels of aldrin and dieldrin measured in flesh (edible portion) of fish from Lower Derby Lake varied from 0.03 ppm to 15.5 ppm. Aldrin and dieldrin in flesh from Lake Ladora fish have not exceeded 0.1 ppm. Fish livers were generally higher in pesticide content. Largemouth bass from Colorado State University's Fish Laboratory had no detectable levels of either aldrin or dieldrin.

5. CONCLUSIONS:

The levels of aldrin and dieldrin found in edible portions of fish caught from Lower Derby Lake far exceed safe limits listed by the World Health Organization. Levels in fish from Lake Ladora should be considered potentially harmful, based on WHO recommendations.

6. FUTURE ACTIONS:

Sampling will continue from both Lower Derby Lake and Lake Ladora.

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2. Radeleff, R.D., Veterinary Toxicology, Lea & Febiger. 1970.

3. Mughal, H.A., Pesticide Levels in Human Adipose Tissue. Arch Environ Health. 27(6): 396-398. 1973

4. Pesticide Residues in Food. World Health Organization Technical Report No. 5 5. November 1972.